The Family Tree of the Rifle

By PROFESSOR OTIS T. MASON Curator, National Museum Washington.

The dogs of war are rifles, and they go I taking the strain. To put the question by different names in different countries. In | the Eskimo in regular form, it would read: the Argentine Republic and Belgium the Given some driftwood about as elastic as a name is Mauser, but in Spain and Turkey | pipe-stem, and sinew cord, having no rigidthey are Mousers, a title previously con- ity, to construct one of the best bows in the ferred on cats. Austria, Chile, Germany, World. Result, the sinew-backed bow. I Holland and Roumania call the dogs of am not going to say that the Eskimo had

uced, in the United States, ten years ago, they were Krag-Jorgensens. They are Lee-Medfords in England, Lebels and Berthiers in France, Mann-Carcanos in Italy, Daudeand Springfields in the United States. The both in its construction and use. Its simproved breed over those of fifty years ago, a javelin, a spear, or a harpoon discharged If you will peep into a dog's mouth, or, from a bow. Its working end is a repetition tetter, that of a wolf, you will see four of these. To give it directness and distance pointed teeth called canines. They look for all the world like cartridges. There are | ties and feathers have been invented, the similar teeth in your own mouth, but they | effect of which is somewhat like the resistwould be sorry weapons in a contest with carnivorous beasts, all of which have excellent piercing and lacerating weapons in

their jaws. It would seem that the creator in depriving humanity of such weapons and at the same time giving them larger and to be cunning and thoughful. Go to work and make teeth or fangs sharper than ony of these. Put wings on your teeth, so they may fly and bite, and springs in their limbs so that they may bite deeper and surer.' The rifle cartridges are these winged fangs, and for this reason such weapons are called the dogs of war.

The family tree of the rifle would read somewhat in the following order: Breechloading rifle, son of percussion musket, son of Flintlock Musket, son of Matchlock Musket or Hackenbuse. Musket is old French for Hawk, son of Terquebus Crosbow, son of Longbow, son of Bow, son of Nimrod. It will be interesting to trace this genealogy downward with greater care remembering that as you have the canine teeth and all the complex apparatus of the missile and the mechanism for making it effective in the rifle and its ancestor.

The whole group are weapons for piercing, cutting or mangling at a distance-they are missile. The most primitive bow now in use is a long spindle of wood, with little attempt at differentiation of parts or ornaments. The Hawaiians, Samoans and other brown Polynesians had no bows, the same is true of the Inca Peruvians, But all other uncivilized peoples had the weapons

INDIAN INVENTORS. The Indian tribes about the Straits of Magellan may be taken as the starting point in the long series of inventions. Their bow is a stick, consisting of inflexible grip for the hand, elastic wings to speed the missile, string to transfer the energy to the arrow and the arrow itself, with rigid shaft, piercing head of bottle glass, feathknives, swords and pole axes. These, one cle, operating gradually and in any direcsuddenly and in one direction as any pent up force will act when instantly released. arm is slowly accumulated in drawing and suddenly set free in releasing. I may be pardoned for dwelling a moment at this point, for human intellect was on the rack thousands of years devising first this and then some other mechanism to hold the force of elasticity and then to release it

From the first it was known that the of an arrow, called the shaftment, ought to have the greatest resistance from the air. The inventions proposed to secure this will be considered later.

Starting out from the Fuegian bows it is tribes have constructed theirs, governed by the materials at hand and the game to be killed. No better method could be found for making this study than to walk with the savages all the way from Magellan strait to Point Barrow. The South American, middle American, eastern North American and Rock mountain tribes all use the plain or self-bow. Here it is of black palm wood, there of hard tropical wood, in another place it is black walnut, osage orange, hickory, ash, oak or even willow, owing to the varying humors of dame nature, but over nearly the whole continent as well as in the entire negro, Malay and European areas only the simple form is used.

In passing it will be well to notice a piercing projectile in the Amazon region and among Malay peoples that may have whispered in the ears of the men who have invented the arquebus; I mean the blow tube arrow. There is a barrel to give direction to the missile, which is sent on its mission by the expansion of a gas-the human breath-in the tube, and by another gas produced by the explosion of the gunpowder in the firearm. No historic proof survives, however, that any collusion existed. The perfection of the self-bow was reached in England, as everybody knows the sentence, "As spring comes on the who has read Roger Ascham's "Toxophilus" or Conan Doyle's "White Company," or who has heard of Robin Hood, said to have been able to shoot a flight arrow the

distance of a mile. OTHER KINDS OF BOWS.

On the Pacific coast of America, in the throughout Asia, the self-bow gives place to the compound or the built up bow. In a few areas the ingenuity of man has had to contend against terrible odds, which, however, have quickened his intellect to produce on Hudson bay a sorry-bow in three pieces, a grip and wings of bone lashed together; or on the treeless regions of the Missouri a horn-bow.

But the tribes of California and Utah knew how to make a broad bow of yew or other wood, to shred sinew from the shoulders, legs and tails of animals until it was as fine as gossamer, to mix it up with glue and to plaster it on the back of the bow to

look very much like smooth bark. Herein was realized the climax of howmaking, to secure a rigid support on the belly and the maximum of elasticity on the back. But the most ingenious invention of savage man is the sinew-backed bow of the Alaskan Eskimo. He has no timber, only drift wood, but it will do for the columnar strain. After shaping this with broad wings and round grip, he makes a hundred yards or so of the best sinew twine or sennit, about the size of wrapping twine. This is laid on the back of the bow from nock to nock and caught by half hitches over various parts of the wings, forming one or two cables along the grip. These cables are often so related that they may be wound up to increase the tension. As soon as the string is drawn, the tendency of the drift wood to snap is overcome by the many little sinew fingers grasping the wood and

The Evolution of Modern Firearms. The Bows of the Fuegians and North American Indians.

war Mannlicher, but in Denmark and, in- no teaching from Asia, where in Japan, compound bow of wood, rawhide, horn, etc., The arrow has kept pace with the bow in

in its flight, shafts with two specific graviance used by the Peruvians in steering their THE CROSSBOW.

Who first thought to set a bow on spring. The Latin name is arcus balistarius, whence arbalest. The first mention in England is about the time of the Nor-

rain one morning had wet the crossbow cords and rendered the weapons useless. But the English bowmen had kept their bows in their cases and were able to utterly route the Genoese. Pope Innocent II foras "deadly and hateful to God," The

lar during five hundred years. Among the

most skillful of arbalesters were the Geno-

arbalest consists of stock, bow, groove for the bolt, cord, nut or catch to arrest the ord, and trigger for release. According to the manner of stringing, inventors busied themselves in the centuries to improve the implement. The order of their production may have been thus-crossbow, set with both hands; arbalete a pied-de-biche, set with a lever; arbalete a tour, set by means of a windless or moulinet, and arbalete a cric, set with an arrangement of cogs. The killing power of these weapons is put all the way from forty to one hundred yards. Only two bolts could be shot in a minute, while an archer would discharge a dozen. The inventors of gunpowder substituted the elasticity of a gas for that of wood or horn or steel, and a tube for a groove. They also cut the shaft from the arrow. The trigger and nut remained, and in a mysterious way the spark released the invisible spring. The Chinese may have made firecrackers before the Christian era, the Byzantine emperors may have thrown Greek fire thirteen hundred years ago, Bacon and Schwartz may have concocted real gunpowder a hundred years later; but Edward III was the first to risk his life on his "crakeys (Greeks) of war." in his con-

not born until twenty years later. Small arms of any serious account began with the culverin, requiring two persons to manipous discovered America. The arquebus was fit of its owner consisted of powder, flask, touch box, bullet bag, musket rest and burning match. It is then an easy road through file and pyrites, wheel and flint (sixteenth century); flintlock (1625-1842) percussion caps; modern cartridges and magazine, breech-loading rifles. The genealogy of the rifle is complete from the primitive bow to the latest arm. There were great jealousies between the three branches of this family 300 years ago. William de Bellay (1589) said of the crossbows, "I would recommend them before the harquebusse, as well for their readiness in shooting, which is much more quicker, as also for sureness As to the long bow, while Sir John Smith (1590) avers that the change from the long

sont des archiers." Washington, D. C.

IN THE GOSSIP'S CORNER.

earlier, wrote, "Mon advis est que le sou-

verrain chose du monde pour les battailles

When Adam in the Garden sat

And named the flowers and beasts and The only language he could use

Was made of words, and words, and

And now the language-manglers sit,

Expanding talk by halves and thirds: And when the net result we scan, The end is words, and words, and words. X X X

A recent issue of the Chautauquan gave much space to American word-coinage, most of the article (by Mr. Leon Mead) being devoted, not to those new words made necessary by improvements in machinery. discoveries in science, etc., but to those of a purely literary value, as, for instance, Edmund Clarence Stedman's "lyronym," meaning an assumed name used by a poet in signing his verses, and Thomas Wentworth Higginson's "densening," as used in 'densening' outlines of the elm," etc. Much may be said justly on both sides of the question of word-coinage, with the bulk of the argument in favor of those supporting to me that the government experts in nomenclature might devote some of their interior basin, among the Eskimo, and | time, with great profit, to devising words to take the place of some of our present

necessary combinations of words, instead of giving it all to the evolution of new and ofttimes ridiculous spellings of those we already possess. Some old words might. with propriety, be restored to their original use and usefulness in the language. Take, for instance, "publican." It is a good old word, short, comprehensive and easily spoken. In its stead we have only the awkward "saloon keeper" and the nondescript "saloonist." On the other hand, if the printer mangles this sentence with the types, I can describe the mishap only as a "typographical error" if I would stick to the dictionary. Why not say "errotype" and be done with it? I don't claim any credit for originality in making this suggestion. The word was invented by one Tim Strong, of Fond du Lac, Wis., while he was editor of the Commonwealth of that city, fully twenty-five years ago. That the language blacksmiths have ignored it is no of the brightest geniuses that ever went down to an untimely grave. Here's another opportunity for the word-coiners. We use dispenses witty savings. Why don't we up every flying bit of gossip and gives it added scope and impetus? Sometimes we say "rumor-monger;" if we (and he) are in "faker" (and that usually misspelled with

Yet another word we should use, as being "manufacturer," with the modifications that the change implies. "Manufacturer." "manufacturing" and "manufactory" are awkward and do not properly describe existing conditions. A "manufacturer" is one who makes things by hand-that is, by man power-and there are few such in these days of improved machinery. It follows that there is little "manufacturing" done. A "manufactory" is a place where things fewer of these than of the manufacturers. "Factor," "factoring" and "factory" are space in writing and printing, if they come

who was wiser than I, "and we will dis-

As a paradoxical witticism this sentence | know God. has few superiors, but, consciously or unconsciously, it is coming to be the economic gospel of the race. If I were asked what is the greatest evil apparent in American life to-day, I would answer: "The striving for luxury-that is, fine living and attendant idleness; or, if the fine living be not attainable, for idleness alone." All the other evils, including drunkenness and debauchery, follow in their train. Every prominent | to-day; that is the modern spirit. Men are street has its parade of idlers of both sexes, afternoon and evening; every saloon and cigar store has its knot of youthful erence. Religion and knowledge have too hangers-on; every downtown corner has its group of young loafers, ogling the passthe open, positive, greater ones would seem ly is the careless attitude of parents, or worse still, their careful efforts to prevent offspring only for a life of ease.

fame from their youth up, and with the inculcation of luxurious ideas he has fallen into complete obscurity. The son of a wellto-do and well-known artist, his early desires were granted until he was thoroughly spoiled, and when his father died, his mother carried on the work with enthuslasm. His family position brought him into public notice and his musical ability and to the truth. made him a society pet. Before his majority was attained his entomological retorship of a great scientific institute. But there he stopped. He had not been trained to do anything save in the first flush of enthusiasm, and having won certain social recognition, having accomplished a few scientific feats and taken part of a course in medicine, having written three or four moderately successful waltzes and for a brief period edited a small magazine, he was content to rest on his oars, and soon in a cheap club, whereas he might be an honored member of the best. Too weak to be vicious, too indirect to be forceful, even for evil, he is the most striking example I know of the bad results of our growing American tendency to bring up the succeeding generations without fitness for anything but dilletantism. And if the result is so bad in a case where there was the excuse of comparative affluence duracter, what shall we expect the outcome to be if the surroundings are made comfortable-not luxurious-only by that labor THE GOSSIP.

The Holy Place.

At silver of gray leaves; at look of lace About a woman's throat; at little feet, Curled close in hand that clings; at sti-

Old gardens; at the flow and dip and grace sweeping fabric; at the phantom race Of shadow ripples in the tides of wheat, Where great, still spirits murmur as they

Souls see God as in a holy place. What of the wrinkled face, the poor, coarse

Dead leaves and ruined walls and fields that Rattling stark husks? Of little feet that stray From clinging hands, and never find the way? He knows no holy place for whom the clod Stands not an altar to the living God.

-Zona Gale, in the December Bookman.



She-liow that woman we just passed does hate me! He-She looked pleasant enough. Sh -- That's all done for effect; but if you noticed, she never turned

to look at my new cloak.

THE VOICE OF THE PULPIT

D. Pastor of the First Universalist Church, Hartford, Conn.

"He that hath an ear let him hear what

There are three great words which have characterized modern life-the life which begins, say, with the renaissance, with the reformation, with the discovery of America. They are truth, liberty and love. Most of the great movements of our time are the outcome of the ideas for which these words stand. The minds of men have been filled with these great principles, and in every civilized nation society has yielded to

First think what that word truth means. It's only another name for reality, and that, in turn, is only another name for God and His nature. When men are seeking the truth they are seeking to think the thoughts of God after Him, to learn the majestic path His steps have made through the universe, and fathom the mystery of His life in the soul of man. That is a thought which has been growing mightier in the minds of men. They have begun to find signs of God everywhere-God in the world and the world full of God. They are talking of this visible form of things as a universe-a turning or combining of all things in one whole. They are beginning to believe that there are no hopeless contradictions in the world, no alien forces, because it is God's world. "The sea is His, and He made it." "The earth is the Lord's and the fullness thereof." "God's in His

And thus, as men are growing to see a larger beauty and a holier grace in the world because they see God there, they are asking to know more of Him. The more obliterate men from God is really giving "Give us the luxuries of life," said one | them a deeper thirst for Him. As we get closer to the facts, as we master more of the truth, we are more eager to see and

A SIGNIFICANT THING Secondly, see how much significance there is in the new passion for liberty. We cannot find God except for liberty. We cannot find God except we be free to seek Him. No monopolies may control the route to Him. No man may bar his neighbor's road as he goes in search of God and Truth. That is the attitude of the masses tired of living in a world placarded all over with signs of privilege and favor and preflong been mental territories on which one ever reads the warning, "Keep off the what has caused these mighty struggles for freedom of mind and conscience. The made each one of them He had good reason for making them individuals, and it was a lack of reverence for Him to try to

'Every man for himself" is the motto of the spiritual world. We work out our own salvation. We are judged each on his own merits or sins. We suffer in ourselves the the rewards of good. But all this means its way to God; none may challenge the conscience as it bows to the voice of the spirit. This, also is the modern spirit. It is the resolve to have a free way to God

For a third characteristic of the period we look to the growing sense that "love is searches had won him the assistant cura- of God." Fifty years ago men were emof God. To-day they have got behind that goal of man's. That is the new keynote of theology. It is the great word of a prac-

The secular term by which men express this great element of the modern spirit is word brotherhood. The great movesense of the brotherhood of the whole race | and contemplating something which ought has checked the greed of commerce, in the labor reforms which have protected the weak, organized labor and led an agitation for the larger share of each in the product of all. And that ideal has been before the | what it is. philanthropists who have done so much to promote kindliness and sympathy in dealing with the werk. Truly this is one the great ideas of the age. It is wholly of the modern time. Politics is forcing it; ing the formative period of the boy's char- knowledge is reinforcing it; theology is pro-

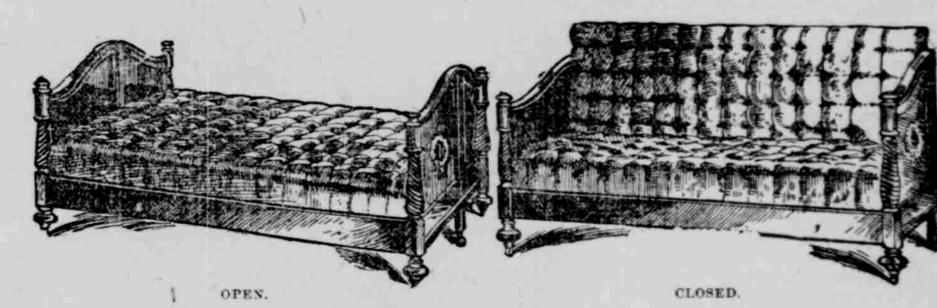
nouncing it loudest of all. TASK OF THE CHURCHES. Now, do not these conditions set the task of the churches for the coming years? Do Gail. they not clearly mark the duty and the opportunity of Christiandom? The churches must become the allies of these great forces moving in the hearts of he people. They may not disappoint the people with a picture of God which disappoints their reason and affronts their moral sense. There are some conceptions of God which it is simply worse than useless-it is harmful-to mention to the modern man. But if the churches can grasp the idea of God as Jesus gave it to them, as Father, Friend, lover of all His creatures, they will find the hearts of those who crave such a God to worship and to serve. We must never forget that human souls need and must have some outlet for the emotions which truth raises in their

hearts. That sentiment is worship. God does not demand that all men shall serve Him in the same way nor praise Him in the same phrases. There is no warrant in the Gospel for that flatiron piety which squeezes all the individuality out of men and insists on their being good after the same pattern. Let there be large liberty in the nonessentials, so long as there is unity in the great essentials. There is no need to painted on lapis lazuli. abolish sects, so long as they co-operate and fraternize. They only afford an outlet of gold and a means for the diversity of gifts to exercise itself. Just as no two leaves are alike, yet all conform to the type on which they are formed, so there need be no two Christian men and women who reflect each | course. other. There is room in God's family for the individual in his fullest development. Let liberty encourage individuality.

But let us remember that liberty is no end in itself. It is only an opportunity. We are God's free subjects and children only that we may seek and love Him out of our own free volition. There is no use in freedom except it be used to the freeman's honor and his country's good. There is no

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going along with liberty.

day golf is to be squandering a treasure on a trifle. There is tremendous responsibility

Finally the churches must translate their doctrine of love into a tongue which the world can understand. They must show their faith by their works. They must the meaning of brotherhood in its highest, holiest sense. The gospel has taught men what brotherhood means; it must not be permitted any organization, any group of men should surpass the church in the zeal and force with which it carries this great thought out among men. We must make men feel that the church has a place for all, a work for all, a love for all. That will require some upsetting of old traditions, caste, with class feeling. It will take hard how to reconcile the pharisee to the pres ence of the publican at public worship. Bu one thing is certain, the solution of that problem is the key to the triumph of the churches in the next century.

GAIL HAMILTON'S CONUNDRUM.

ing women and taking the first or second grass." "No trespassing here." That is She Kept a Party of Notable Persons A-Guessing.

Los Angeles Times.

Gail Hamilton had been in Italy, as she told me, with the pleasantest party in the world, seeing everything that was beautiful, enjoying everything that was fine, studying old pictures, rummaging old shops, getting the best of Florence and Venice, and looking at th Old World from her own original point of view-sweetnes and light and laughter following, as always, wherever she went. They had come slowly north; and, after crossing the channel, a very great gentle-

man took the party-the statesman and his delightful wife, the young girl, the musician and Gail-for a coaching tour through beautiful England to his castle in more beautiful Scotland, Once in Scotland, Gail felt a dream of her life fulfilled. The romance, the poetry

of Scott, which had been a joy of he

confess to be one of the most satisfactory things of its sort which you have seen in your travels. Provided," she added, with a wicked sparkle-she who feared neither king nor kaiser-"you will guess

This to them, fresh from the Vatican. from the manuscripts and missals and marvels of bookbinding, the glories of old bijouterie and goldsmith's work, from ivory carvings and Venetian glass, and, in addition, with all the loveliness in and about this place before them! "Must we guess?" asked one. "Well. then," remembering an old game of their childhood, "to what kingdom does it be-

'It is that orchid-" "Nothing of the sort," with great gayety and good humor. 'But 'partly!' Do you mean that it belongs to more than one kingdom?" "Yes: I think so.

"Perhaps the vegetable, partly," said

"To the mineral?" 'Your mind is running on jewels and the high priest's breastplate. Yes." Why not the animal kingdom, too? asked another, with mockery. "Not amiss. Yes, certainly, the animal." "Animal-vegetable-mineral-what in the world can it be? All three kingdoms? It wouldn't be surprising if you added the Without any doubt, the spiritual:" said

Gail, decidedly "You are going to tell us a ghost story in broad daylight," said one, deprecatingly "Is it white?" another asked, still humoring her conceit.

'In some degree.' "Is it pink, then?" 'In some degree. "It is a chameleon on a chain?" "Pshaw! Very different."

"Is it large? 'Not too large,'

'Is it tall?

"It reaches just to my heart." "I wonder what extravagance you have been secretly committing. Is it that little Fra Angelico you longed for?" "No. Nor the little Andrea del Sarto

"I may be brazen. But I am not made 'From whom did you say you bought it might we ask? "I didn't say I bought it at all. But I stood in great awe of the people who put

'I know. It is that Sevres cup."

"It is a rosary blessed by the Pope, of 'It is a Kelmscott book.' 'It is one of those charming figurines.' "No, no: It is something much more sim-

ple and near home, is it not? "A great woman, a great'statesman, a great financier, a great musician-to say nothing of the rest-and all such poor guessers! What is becoming of the American prestige? I won't keep you in sus-Out of sight she hurried, and before long she descended with a pasteboard box in her opened it and took out-her new "Confess!" she said. "Did you ever see

anything more beautiful, more satisfacdoms-the silk, the velvet, the plumes, for gallery to the castle dining hall. to church: liberty of conscience is a thing pins, the wires, the clasps, for the other, above all the blaze of gold and silver and tion in the Philipp'ns."

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shall have when I wear this bonnet to church in Hamilton, I hope, will meet that requirement. And, then, you remember the comparison that has been made between the consciousness of being well dressed and the consolations of religion? It was the custom of the house, having assembled in the drawing room, to form in procession when dinner was annouced, and to follow the pipers, blowing their pipes for dear life. So the pipers, plaided and kilted, blew out their cheeks and puffed and strutted and swung their shoulders picturesque and fine at the head, and the others, in due order, followed the wild mu-

The spiritual? Well, the frame of mind I | crystal, above the flowers, the fruit, the "frolic wine," perched high atop of the tall epergne, as if it were some rare and brilliant blossom, the chief ornament of the grand dinner table, Gail Hamilton's little Paris bonnet.

The "Progr'm."

Kansas City Journal. "The progr'm? Oh, yes," said the teacher in the sixth grade, "the progr'm was quite songs, there was a recitation from Shaktory? Here, as I told you, are all the king- | sic with various heart stirrings down the | sp'r, a declamation on Napoleon Bonap'rt. an ess'y on the future of footb'll, and man free to play golf on Sunday or to go one; the lace, the straw, for another; the And there they saw, as they entered, gentleman from Verm'nt talked on educa-